

APPLICANT(S): Sergey POPOV
SERIAL NO.: n/a (Nat. Phase of PCT/IL2004/001035)
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AMENDMENTS TO THE CLAIMS

Kindly amend the claims as follows:

1 - 38 (cancelled)

39. (New) A dilating trocar for forming a passageway in a body cavity wall between a body cavity and surroundings by stretching a through primary opening in the body cavity wall to the size of a complete opening, comprising

a cannula having

a housing and;

a tubular passageway portion adapted to the location at the level of said complete opening;

a dilating means designed for stretching said primary opening , and having:

a distal portion, which at least from the beginning to the completion of stretching said primary opening is located inside the body cavity,

a dilating portion of changeable geometry disposed adjacent to said distal portion proximally of it, distally of said passageway portion and having dilating surfaces,

a first position wherein said distal portion is located inside the body cavity, said dilating portion is placed into said primary opening so that at least by the beginning of stretching said primary opening the walls of said primary opening along its full length are disposed within the axial limits of said dilating portion, said dilating surfaces are faced the walls of said primary opening and the transversal dimensions of said dilating portion and distal portion measured at least in the same plane parallel to the longitudinal axis of said dilating trocar are considerably less than the outer diameter of said passageway portion to provide inserting said dilating portion into said primary opening with an insignificant resistance offered by the body tissues and without substantial stretching said primary opening,

a second position wherein said transversal dimensions of said dilating portion are effectively bigger than its correspondent dimensions in said first position, and the transition from said first position to said second position leads to stretching said primary opening to the size

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approximately equal to the size of said complete opening and sufficient for introducing therein said passageway portion,

an actuating means for transpositions of said dilating means from said first position to said second position.

40. (New) The dilating trocar of claim 39, having

a carrier having

a distal end and;

a proximal end with a housing;

at least one movable dilating member connected to said distal end.

41. (New) The dilating trocar of claim 40, wherein there is a penetrating means for carrying out said primary opening, which in said first position protrudes distally of said distal portion of dilating means.

42. (New) The dilating trocar of claim 41, wherein said penetrating means comprises a sharp element.

43. (New) The dilating trocar of claim 42, wherein said penetrating means has a protecting means for the protection of said sharp element, including a shield and a biasing spring.

44. (New) The dilating trocar of claim 43, wherein said penetrating means is based on said carrier.

45. (New) The dilating trocar of claim 40, wherein there are

a guide for inserting said dilation portion into said primary opening;

said dilating portion comprises an axial passage, wherein said guide is housed during inserting said dilation portion into said primary opening.

46. (New) The dilating trocar of claim 45, wherein said guide is made as a removable obturator.

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47. (New) The dilating trocar of claim 40, wherein said carrier is adapted for placement inside said cannula passageway portion and has a carrier attachment means allowing removable attaching said carrier to said cannula.

48. (New) The dilating trocar of claim 47, wherein said carrier attachment means is made as a controllable latch mechanism allowing engagement/disengagement of said carrier and cannula housing.

49. (New) The dilating trocar of claim 40, wherein said cannula fulfils the role of said carrier and said dilating members are connected to a distal end of said cannula passageway portion.

50. (New) The dilating trocar of claim 39, wherein, there is a longitudinal trocar axis and in said first position, said dilating surfaces and said longitudinal trocar axis are substantially parallel to each other.

51. (New) The dilating trocar of claim 50, wherein said dilating surfaces movement occurs mainly in the transversal direction with respect to said longitudinal axis.

52. (New) The dilating trocar of claim 51, wherein said dilating means having
said dilating portion including an expandable balloon and;
said actuating means made as a balloon actuating means designed for expanding said balloon from said first position to said second position by its filling with fluid after said balloon placement into said primary opening.

53. (New) The dilating trocar of claim 52, wherein said balloon actuating means is made as a cylinder containing said fluid in the form of liquid, communicated with said balloon and having a plunger slidably housed inside said cylinder and adapted to forcing out said liquid from said cylinder into said balloon to expand it and to permitting said liquid to revert from said balloon again into said cylinder to collapse said balloon.

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54. (New) A dilating trocar for forming a passageway in a body cavity wall between a body cavity and surroundings by stretching a through primary opening in the body cavity wall to the size of a complete opening, comprising

a cannula having a tubular passageway portion adapted to the location at the level of said complete opening and a proximally disposed housing,

a penetrating means for forming said primary opening,

a dilating means designed for stretching said primary opening, and having:

a distal portion, which at least from the beginning to the completion of said primary opening stretching is located inside the body cavity,

a dilating portion of changeable geometry disposed adjacent to said distal portion proximally of it and distally of said passageway portion, and

having dilating surfaces whose length is not less than the thickness of the body cavity wall,

a first position wherein said distal portion is located inside the body cavity, said dilating portion is placed into said primary opening so that at least by the beginning of stretching said primary opening the walls of said primary opening along its full length are disposed within the axial limits of said dilating portion, said penetrating means protrudes distally of said distal portion, said dilating surfaces are faced the walls of said primary opening, and the transversal dimensions of said dilating portion and distal portion measured at least in the same plane parallel to the longitudinal axis of said dilating trocar are considerably less than the outer diameter of said passageway portion to provide inserting said dilating portion into said primary opening with an insignificant resistance offered by a body tissues and without substantial stretching said primary opening, while said cannula passageway portion is located beyond the body cavity wall above it,

a second position, obtained only after said first position, wherein said transversal dimensions of said dilating portion are effectively bigger than its correspondent dimensions in said first position, and the transition from said first position to said second position leads to stretching said primary opening approximately to the size of said complete opening sufficient for introducing therein said passageway portion,

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actuating means for transpositions of said dilating means from said first position to said second position.

55. (New) A method for forming a passageway in a body cavity wall between a body cavity and surroundings performed by a dilating trocar set comprising: a cannula with a housing and a tubular passageway portion; a penetrating means, a dilating means comprising an actuating means, a distal portion, and a dilating portion having an extendable transversal dimensions, protruding distally of said cannula passageway portion, therewith in the initial state a cross-sectional area within the limits of an overall outer contour of said dilating and distal portions along their full length is considerably less than one of said cannula passageway portion, said method, comprising:

performing a through relative small primary opening in the body cavity wall by said penetrating means so that, in the following, the dimensions of said primary opening allows inserting therein said dilating portion with insignificant resistance offered by the body tissue and without substantial stretching said primary opening,

inserting said dilating portion into said primary opening by means of said guide so that said distal portion is located within the body cavity, while said cannula passageway tubular portion is located beyond the body cavity wall above it,

fulfilling said complete opening by extending said extendable transversal dimensions of said dilating portion in the transversal direction by said actuating means, thereby stretching said primary opening to a complete opening sufficient for inserting therein said cannula passageway portion,

inserting said cannula passageway portion into said complete opening,

final operations including removing at least said actuating means from an interior of said cannula.

56. The method of claims 55, wherein fulfilling said primary opening and said inserting of said dilating portion into primary opening are accomplished as a single operation.

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57. (New) The method of claim 55, performed by said dilating trocar set wherein said dilating portion includes a balloon expandable in the transversal direction and an actuating means in the form of the system for controllable fluid supply into said balloon,

said method, wherein:

said extending said extendable transversal dimension of said dilating portion is accomplished by supplying a pressurized fluid into said balloon leading to expanding said balloon and stretching said primary opening to said complete opening,

said final operations include at least partial removing said fluid from said balloon and removing it from said cannula.